Volume Rendering and Uncertainty Visualization

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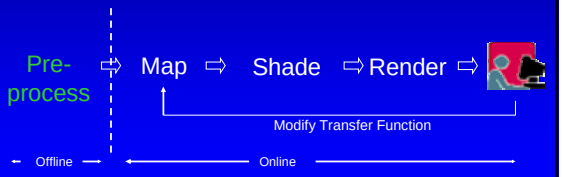
Volume Visualization Pipeline

- Map data to renderable quantities
- Shade (Light) w/ physics approximation
- Render to final image



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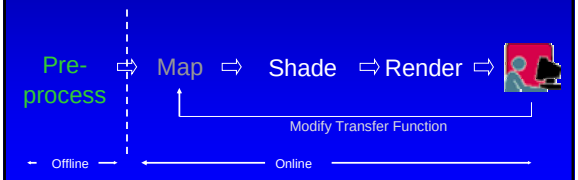
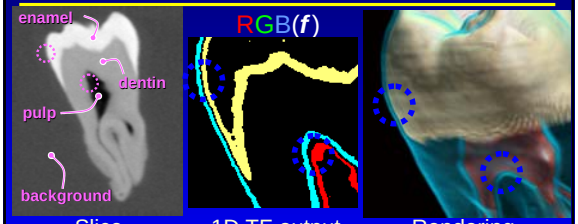


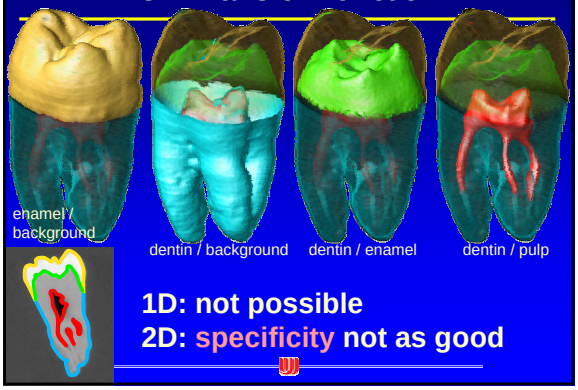
1D TFs: limitation



Slice | 1D TF output | Rendering

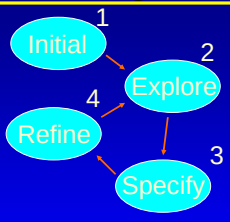
1D transfer functions can not accurately capture all material boundaries

3D Transfer Function



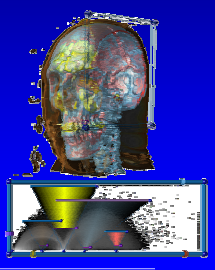
1D: not possible
2D: specificity not as good

The Big Picture



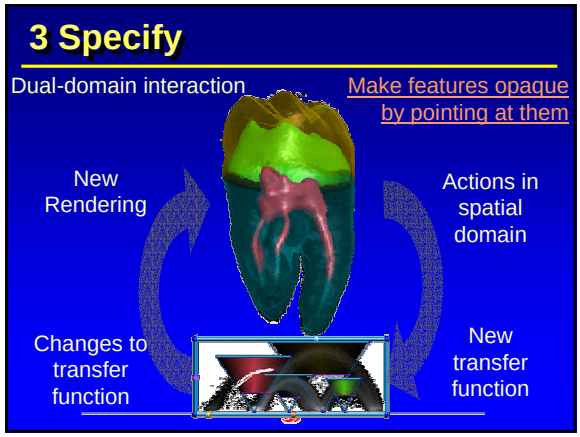
Understanding from immediate feedback

Interactive



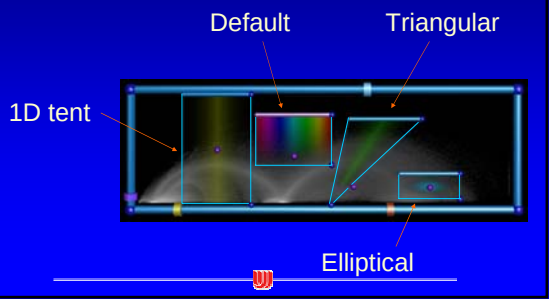
Visible Male CT

3 Specify



4 Refine

Classification Widgets

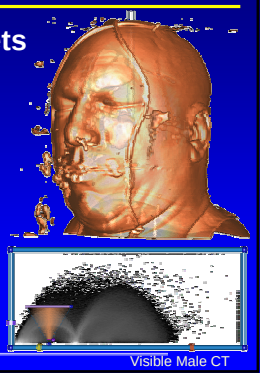


4 Refine

Classification Widgets

Display of Surfaces…, Levoy 1988

Generalized triangle function



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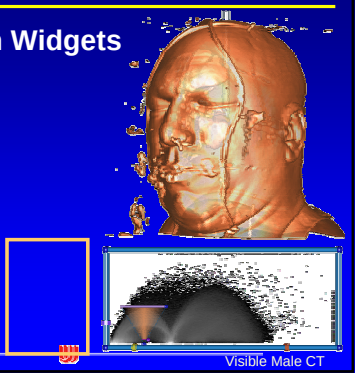
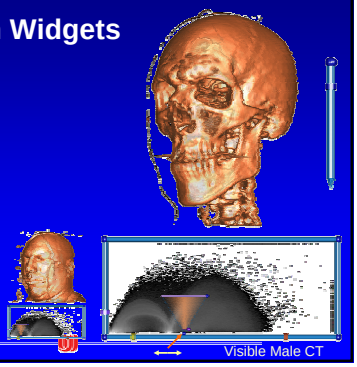
Classification Widgets



4 Refine

Classification Widgets

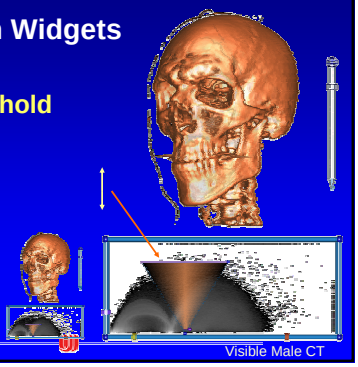
- Translation



4 Refine

Classification Widgets

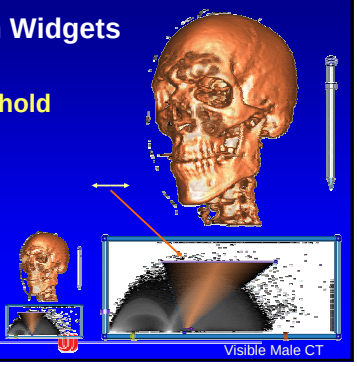
- Translation
- Upper threshold



4 Refine

Classification Widgets

- Translation
- Upper threshold
- Shear



4 Refine

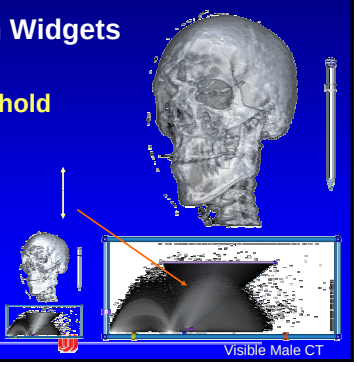
Classification Widgets

- Translation
- Upper threshold
- Shear
- Color

4 Refine

Classification Widgets

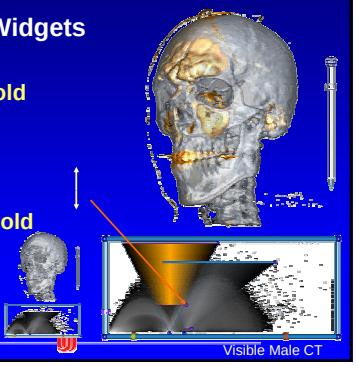
- Translation
- Upper threshold
- Shear
- Color
- Opacity



4 Refine

Classification Widgets

- Translation
- Upper threshold
- Shear
- Color
- Opacity
- Lower Threshold



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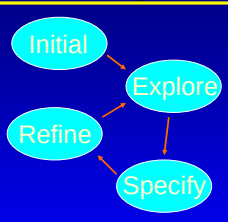

Interactive